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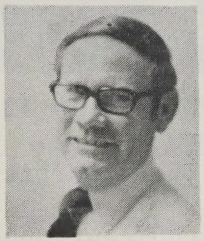
WR4ACF (146.04/64)

CLUB CALL:
W4DW

"RALEIGH AMATEUR RADIO SOCIETY NEWS"

JULY 1980 ISSUE 125

LEADING EDGE



SHERMAN STARNES
W4TZU

The development of the Phase 3A satellite which has been the feature subject of this column since its inception ended on May 23 when the ARIANE rocket which was to place it in orbit failed in the first few seconds of flight as reported in the terse bulletin in the June newsletter. A chronicle of the flight was read by Jan King,W3GEY, on the AMSAT net on June 3.

At 4.4 seconds after lift-off, one of the four motors in the first stage cluster underwent rapid oscillations in the combustion chamber pressure for 1.6 seconds. The condition occured again for 10 milliseconds at 8.35 seconds after lift-off. After that the operation deteriorated to the point that the flight guidance system could not overcome the extraordinary forces resulting from the malfunctioning of the motor. At one time the rocket was spinning about its longitudinal axis at 60 degrees per second! The vehicle began to tumble, resulting in unusual aerodynamic forces on the structure and eventually in structural failure. Fluid lines and wiring cables broke under these forces and caused a fire and explosion, destroying the

hope of the amateur satellite community but not the Phase 3A satellite. The test signal from Phase 3A remained steady throughout the ordeal, ending only when the whole assembly sank in the ocean twenty miles and two and one-half minutes down range.

Efforts have already started to build a Phase 3B satellite. Left over from the 3A development program are a complete set of solar cells, a complete spacecraft sheetmetal structure, a set of batteries, a 35% completed wiring harness, some module housings, sensors, printed circuit boards, and some CMOS parts. Additionally, the 30 man-years of effort and the technology spawned by it in the Phase 3A development program are invaluable resources.

The most critical requirement is a launch opportunity, the best being another ride aboard another ARIANE, the worst aboard some other vehicle requiring the design of a new spacecraft structure, adapter and thermal design. The third ARIANE test flight was scheduled for November but a slip is likely due to the May 23 failure. Leading Edge will continue to follow the Phase 3 program as it progresses but we will look at some other amateur satellite efforts in the coming months as well.

The condition of OSCAR 7 continues to deteriorate. The spacecraft batteries are dead but each time the satellite enters darkness it switches to mode D in an attempt tocharge the batteries. When it again enters sunlight, it powers up and enters mode B, the default mode, Attempts to switch it to mode A are seldom made so its down to mode B, daylight operation only.

At the risk of being momotonous, OSCAR 8 continues to perform flawlessly.

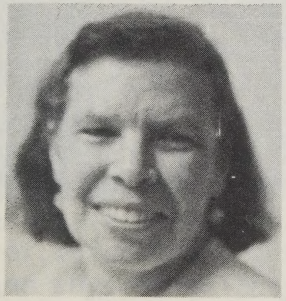
TRANSMITTER HUNT

Lynn Pendleton
K4NYV 787-2039

There will be a 2 meter transmitter hunt July 12 beginning at 2:00pm. Those participating should meet on the rear upper deck near the west community room to be logged in as contestants. The hunt will begin at 2:30pm and end at 5:30pm. The frequency will be 146.52MHz. and the same times will apply on Sunday in case of rain on Saturday. A $25 cash prize will be awarded to the 1st RARs member to locate the transmitter. Everyone is invited to participate!!

Marty Silver, KA4IWX, in her ham shack.

Marty Silver, KA4IWX, got interested in Ham Radio when she was a Navy Radio Operator. Although she was an avid SWL for many years, she did not know anyone who was a ham. At last, Sir Galahad (better known as KS4G, Jim Martin) rode into view and told her about the Novice classes at McKimmon Center. She began the classes in January, 1979 and by May had her Novice ticket. With unbounded optimism, Marty had purchased her Kenwood TS 520 S before she took the Novice test. It is no suprise then, to find out that Marty was on the air the day after she got her ticket.



Not content with the Novice license, Marty got her General ticket at the Charlotte Hamfest this year and upgraded to Advanced at the Durham Fest in May.

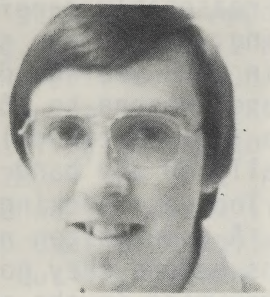
Y LOG
MURRAY HAKE
W6MVZ

She is an avid CW operator and in August got bitten by the DX bug. Since then, she has worked 72 countries. In fact, she has her shack next to the kitchen so that if she hears anything interesting she can work the station without havin having to stop whatever she is doing.

Marty's backyard is a maze of wires. Her OM, Mike (who enjoys 'another' radio service) is her antenna expert. I think she has a dipole or longwire going in every conceivable direction.

At present, Marty works only the lo-bands. I hope that soon she will get 2M gear and do some rag-chewing locally.

Audrey Browne, WB4ZSM, subject of YLog's June profile.



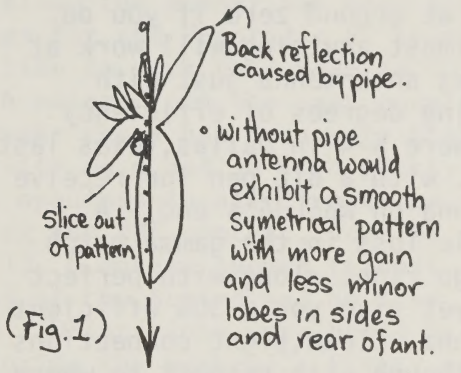
NEWS & VIEWS

CHARLES OSBORNE
WD4MBK

With the June VHF Contest this weekend I almost forgot about my article. By the time this appears in print W4ATC's 6m-23cm effort will have either done out the competition or done in the operators. Field Day will have also come and gone and most likely the majority of us will be ready to work the brain and not the body for a change. Curl up in your easy chair with this article and see if I can't change an idea or two you may have about antennas at VHF.

First off I claim only expertness through experience so the two classes I've had won't figure into what I say as much as the 80 antennas I've built for 50-1296 MHz.

Each person it seems has his own ideas of which VHF antennas are good and why. Since they are seldom installed with proper spacing from other antennas and pipes, the results can be misleading and downright strange. For instance, a fair number of 2m operators place their vertical beams just above their tri-band yagis on the same mast. Often the mast extends on up a few feet to a ringo-ranger. In measuring the actual antenna patterns from these setups it becomes clear that what appears to be a sharp pattern is really just a normal pattern with a big sharp slice taken out (Figure 1).


Back reflection caused by pipe.
• without pipe antenna would exhibit a smooth symetrical pattern with more gain and less minor lobes in sides and rear of ant.
slice out of pattern
(Fig. 1)

This gives the impression of a sharp antenna but the gain will be much lower than that possible if the antenna didn't see the mast pipe in the middle as a big reflector amidst the directors. To cure these problems, you could mount it on a fiberglass pole or sidestack it with something else, a 220 FM antenna or another antenna just like the original. For best performance, either mount the antenna on a mast perpendicular to the elements or on a nonmetallic pole if parallel to the elements.

If stacking two antennas, a good rule of thumb is one-half their boom length for spacing distance. Remember,

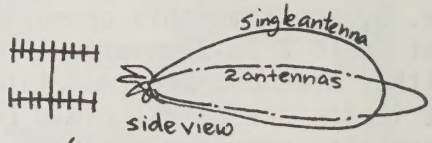
phasing is important. Put both antennas up just alike. Pay particular attention to which side of the driven element goes to the center conductor of the coax. It doesn't matter is the gamma match or fed element side is up or down (except for water drainage) just be sure to not feed the top on one side and bottom on the other. You'll be back at ground zero if you do.

Almost anything will work at VHF as an antenna just with varying degrees of efficiency (We were S-4 in Dallas,Texas last Sept. with a BIC pen for receive antenna on WB5LUA's end). A little loss in the gamma match may go right along with perfect SWR yet give you a 30% efficient antenna. Clean,tight connections and though with respect to where the antenna is in relation to objects larger than ½ wavelength (usually the driven element size) will help a lot. A tri-bander is much larger than ½ on 2m so it will look a lot like ground to the 2m antenna. If the 2m antenna is mounted close to the tri-bander a high radiation angle may have most of your signal aimed at OSCAR instead of the horizon.

Most people mount their antennas for mechanical ease instead of considering maximizing performance, or even a compromise of the two.

Each added antenna in an array adds its captured energy to the total. Theoretically, each time you double the size of the array you increase gain by 3dB. Usually 2.5 dB is a reasonable figure to expect if you were reasonably careful of losses and spacing. As you can see, to go up in gain 10dB you would have to go from one antenna to 16 yagis. That is a feat electrically and mechanically on any band.

Let's look at stacking two antennas. A point often not noted in designs before they go up the tower is what you want in the pattern. Stacking side by side narrows the beamwidth and would make separating two interfering repeaters easier. Stacking the same antennas one above the other would simply lower the radiation wasted going out into space at high angles (Figure 2).



(Fig. 2)

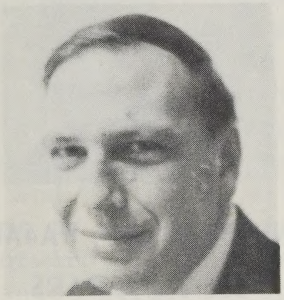
You get your gain without an increase in pointing difficulties. You are also able to mount them on the mast pole without crossbooms, etc. This works well for horizontal antennas since the pipe doesn't lie in the plane of the elements.

Pointing problems are not to be laughed at. At State our 4- 2m 16 element antennas have a 10^{o} beamwidth. Wind can cause several S units of flutter at times. The antennas are sharp enough that I can tell whether a station is in Burlington or Greensboro by antenna position when peaked. On 432MHz, with an even narrower beamwidth, I

can separate stations in Appomattox and Lynchburg, Va., as well as Washington and Baltimore. On a normal night WD4FZF in Goldsboro can copy me with 10 milliwatts SSB to our antennas on 2m.

Next month we'll talk a little about how a properly installed (at the antenna) quality preamp can do more than quadrupling your antenna array.

73 CU on 2m and 70cm!



ROAMIN' THE BANDS WITH DOC

G. C. COBB "Doc"
W4YZX, President, Rars

Well, its the middle of the Summer doldrums as far as DX is concerned on the HF bands. The noise level is way up and the skip is somewhat shortened for the 40 and 80 meter bands. Of course, 160 is practically closed until cool Fall weather lowers the QRN.

All this doesn't mean that you might as well go out and sell your rig, however, there is still plenty of fun to be had and much to do around the shack during the Summer. For one thing, it is the ideal time to do your Antenna work the best laid plans of Winter are often accomplished during the Spring and early Summer. If you have some antennas to erect, as I do, better get on it as the Fall will be here before you know it and nothing is worse than "stringing wires" in coat and gloves.

Also, the summer has some good things for the "Sporadic E" types who like to work this mode on 10 and 6 meters. In the past couple of weeks there has been very high activity on 6 and 10 with pretty good openings in all directions. During the VHF contest, June 12 and 13, 6 meters opened to most areas of the States and no less than 7 DX stations were heard by me during the weekend! Pretty good for a "local" band, huh? I managed to snag 3 of these for new ones on this band bringing the total to 29 countries worked. Not bad for 20 watts. Guess I'll have to spring for a linear before long.

There has also been some long haul work on 2 and 220 via meteor scatter, and atmospheric ducting. The local guys have had a sort of "pipeline" north and south for the past 3 or 4 weeks. This is expected to continue off and on throughout the rest of the Summer.

One of the problems that this type of propagation causes is the repeater interferrence which has been observed throughout the area. This is one problem which most of us will gladly suffer through in

order to reap the other benefits. From 15 on up, this time of year offers some unique band conditions that should be exploited rather than just "cussin the static."

I have a new Beverage Antenna at my QTH for 160 and 80 meters. It is oriented East-West with no termination, is 1200 ft long and is up an average of 15 ft. We'll give it a workout this Winter and let you know how it hears. Maybe this will get me that Hawaii on 160 I have been trying for. Am also putting up a new top loaded vertical transmitting antenna for Top Band with a number of radials.

Forty meter CW has been a blast the last few weeks with lots of DX around. If you haven't tried this lately, begin listening about 9:30 EDT and tune from 7.005 up to about 7.050. I have heard at least three pileups every night for the last month. Also 10 m phone is getting a lot of activity right now as the QRN gets bad on the lower frequencies. This band has had every continent present every day for some time now. Only occasionally is the band what you might call "dead."

Latest news from the FCC is that the new allocation at 10 MHz will be CW only. This band is only 50 kHz wide so that makes good sense. I hope this decision will be finalized sometime this year. Also, the FCC has informally stated that a law authorizing the collection of fees for licensing will allow them to again issue special, preferred, and requested call signs. The rewrite of the Communications Act by Congress has fees in it. If you have thoughts on these issues, let us all share them.

Well, 73, gud hammin' and see you at RARS meeting,

Doc, W4YZX

MINUTES OF LAST MEETING

ANN BRADLEY, WA4APK

Secretary, RARS

The regular monthly meeting of the Raleigh Amateur Radio Society was held in the West Community Room at Crabtree Valley Mall on Jume 4, 1980. The meeting was called to order by President "Doc Cobb", W4YZX, and members and guests were welcomed. The roster was signed by 76 persons.

The primary subject for discussion was Field Day which will take place Saturday and Sunday, June 28 and 29. The site chosen by the Field Day Chairmen and the executive committee is the picnic area at the NSCU Faculty Club. There is adequate space for motor homes or enclosures for operating stations, suitable

arrangement for antennas, restroom facilities, and a comfortable area for members and families to gather to observe and visit. The club plans to make this Field Day a family gathering. It is hoped that all members will come out and take part in the activities--even if you have never had an interest in Field Day before. There is to be a "Pig Picking" Saturday evening at a reasonable cost of $3.00 for adults and $1.75 for children. There will be refreshments, coffee and snacks throughout the weekend. So come on out and bring the family. See what's going on. Hang around and watch and listen--maybe log for a bit. Perhaps you'll get the urge to operate a little. Before you know it, you'll be caught up in the excitement and Field Day will become as important to you as it is to those who look forward with such enthusiasm to that frantic weekend. There will even be prizes for club members. A prize will be given for the most contacts logged in any 1 hour period by phone and also CW.

The Advisory Committee dicided at its last meeting to bring before the Club the proposal to authorize $200 to the Field Day Committee for capitol equipment, and $200 for expendables. Both motions were made, seconded, and carried. It was also recommended by the Advisory Committee that $1500 be allocated at this time for prizes for next years hamfest. This motion was also made, seconded, and carried.

President Cobb announced that there will be another transmitter hunt on Saturday, July 12, or in case of rain, Sunday, July 13. Participants will meet on the upper deck at Crabtree Valley at 2:00 pm. First prize will be $25.00. There will be an appropriate second prize and also a "booby-prize" which will be presented at the next RARS meeting.

Jesse Hodges, W4JG, was recognized by President Cobb and the club for an award presented by the Quarter Century Wireless Assn. for 50 years in ham radio beginning in 1930. Congratulations Jesse! And best wishes for 50 more years of happy hamming. Phillis Wainwright, N4CKM, commended those in the club who are responsible for keeping the repeater going. Those of us who use the repeater tend to take it for granted, not stopping to think that when a problem develops, someone has to be available to put things right, rain or shine--hot or cold. Thanks from all of us--Jack, George, Lowell--and all the rest who have done their bit at one time or another.

Paul Sims, WB4YBF, reported that he has obtained a 10-10 number for the club call, W4DW. He presented the club with a 10-10 certificate #29110, Sir Walter Raleigh Certificate #100 Honorary Charter, A Lost Colony Certificate #152, not to mention a few QSL cards confirming contacts on 10 meters. Paul has been quite busy in the last month operating for W4DW. Other members are invited to lend a hand. We could all take part in adding to the "wallpaper" for W4DW.

Bert Bailey, W4FMN, reported that Rex Hospital has asked RARS to help when they move into their new quarters next September. Members with hand held 2 meter rigs will be needed to provide constant communications to assist staff in moving patients who need full-time supervision and monitoring. Members should keep this project in mind. More will be discussed at a later meeting.

The program was a very interesting and informative discussion on the MARS traffic nets and their operation. Bill Feehan, WB4EOV, on Army MARS; Bob Sherril, K04P explained Air Force MARS; and Chuck Littlewood, K4HF, added information on Navy MARS. This is a well organized worthwhile service in traffic handling that we should all be aware of.

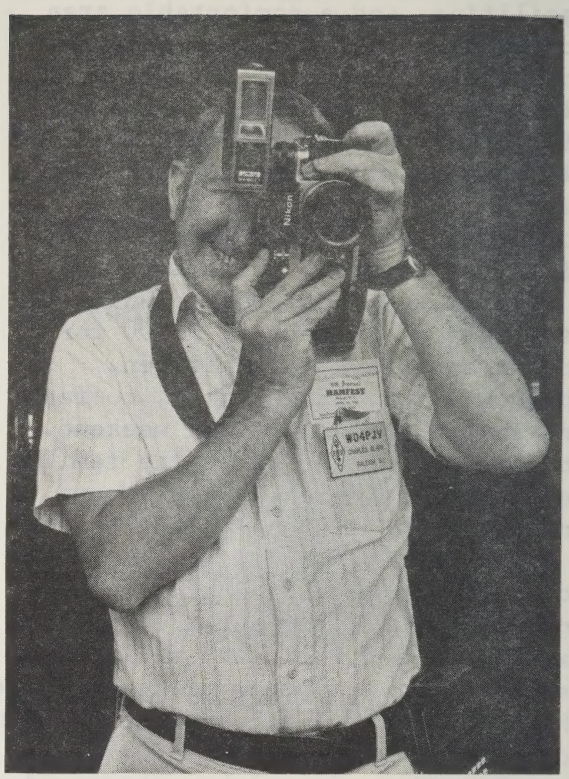
The drawing was held for the door prize with Glenn Lampley, WA4VSL, winning the Barker and Williamson Coax Switch. The meeting was adjourned following coffee, donuts and fellowship.

Hurricane season is here!

Remember these terms.

HURRICANE WATCH: hurricane may threaten within 24 hours.

HURRICANE WARNING: hurricane expected to strike within 24 hours.

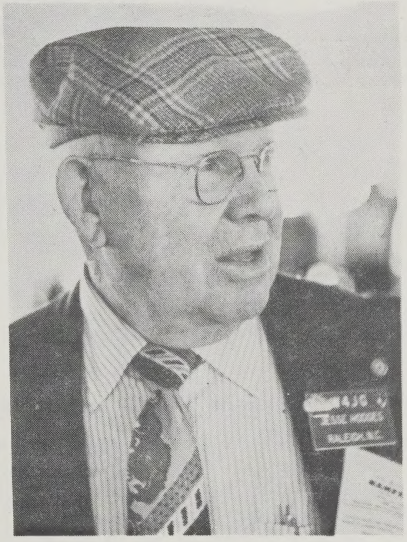


SMILE, if you see this person standing in front of you like this. He is Charles Clark, WD4PJV, a RARS News photographer. Charles provided the YLog photographs for the July issue. Walt Short, N4SW, another RARS News photographer, took this picture.

BERT'S BEAT
WITH
BERT BAILEY, W4FMN

ICING ON THE SMITH CHART

The venerable Smith Chart is a most useful tool for the electrical engineer or technician. It saves much complex mathematical maneuvering. Knowing such simple things as locations of voltage minima or maxima, VSWR (or PSWR for that matter), distances to shorts or opens, or reactions of the load to various inputs, the load can easily be determined. Any loads, SWRs or other transmission line parameters can be accommodated. Yet the big problem with practical use of the chart is how in the world does one know what the load is? When the word impedance is mentioned, such things as resistance and reactance rear their troublesome heads. So, how much of that 82 ohm load is reactance and how much is pure resistance? Unless the load is pure resistance (who can be so lucky) its plot gets off the horizontal line thru the chart and gets into the reactive regions. Conversely, to obtain such goodies as SWR or return loss, the load must be plotted, again requiring values of both resistance and reactance. How do we get this info simply? One good bet is the noise bridge, offered for sale in all the ham rags. With this neato device, any load can be broken down into its resistive and reactive components. This then becomes the icing on the Smith Chart cake. With both software and hardware in your hand, how can a ham ask for anything more. Good DX!
*****Bert W4FMN-OES*********



Jesse Hodges, W4JG, of RARS celebrates 50 years in ham radio, 1930 to 1980. RARS wishes him many more years of happy hamming.

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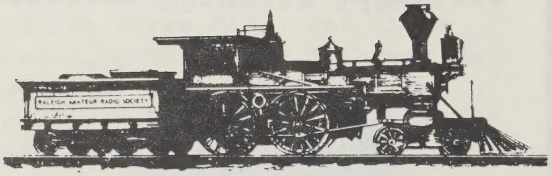

RARS

RARS meets each first Wednesday at 7:30 p.m. in the West Community Room of Crabtree Valley Mall.

RARS TWO METER FM NET — Meets 8:00 p.m. every night
146.04/146.64 Repeater
RARS 10 METER SSB NET — Monday, Tuesday, Thursday, Friday Nights
7:00 p.m. — 28.540 MHz